

1.
 - a. The probability that an employed adult works full time is $\frac{100}{122} \approx 0.820$.
 - b. The probability that an employed adult works on weekends is $\frac{36}{122} \approx 0.295$.
 - c. Given that the employed adult works full time, the probability that the employed adult works on weekends is $\frac{28}{100} = 0.28$.
 - d. Given that the employed adult works part time, the probability that the employed adult works on weekends is $\frac{8}{22} \approx 0.364$.
 - e. No, X and Y are not independent. The probability of working on the weekends varies based on whether the employed adult works full time or part time. Part-time employees are more likely to work on weekends than full-time employees.

2. $\frac{2}{7} \approx 0.286$

3.
 - a. $\frac{0.006}{0.173} \approx 0.035$ or about 3.5%
 - b. $\frac{0.006}{0.11} \approx 0.055$ or about 5.5%

4. a. No, $P(\text{Completed individually}|\text{Homework graded}) \approx 0.218$, but $P(\text{Completed individually}|\text{Homework not graded}) \approx 0.311$. Since these two conditional probabilities are not the same, the events are not independent. Whether homework is graded or not does seem to affect the likelihood that students complete it individually.

Note: There are alternative probability comparisons that also justify this answer.

- b. Yes, $P(\text{Got help}|\text{Homework graded}) = 0.3$ and $P(\text{Got help}|\text{Homework not graded}) = 0.3$. These probabilities are equal, so whether homework is graded or not does not seem to affect the likelihood of a student getting help on their homework.

Note: There are alternative probability comparisons that also justify this answer.

5. a.

	Received ad	Did not receive ad
Made purchase	12	24
Did not make purchase	38	76

- b. Many explanations possible. Sample answer: If the ad had no effect, then customers would behave in the same way as those who did not receive the ad. We would expect approximately 24% of customers to make a purchase in any given week and $0.24(50) = 12$. Since the total number of customers who received the ad is 50, there must be 38 customers who did not make a purchase.
- c. The company would NOT want the events to be independent. If the events are independent, then the probability of making a purchase is the same whether the customer received the ad or not. If the events are NOT independent, then seeing the ad has an effect on consumer purchases, which is the hope of using an advertisement.

6. B

7. B

8. D